

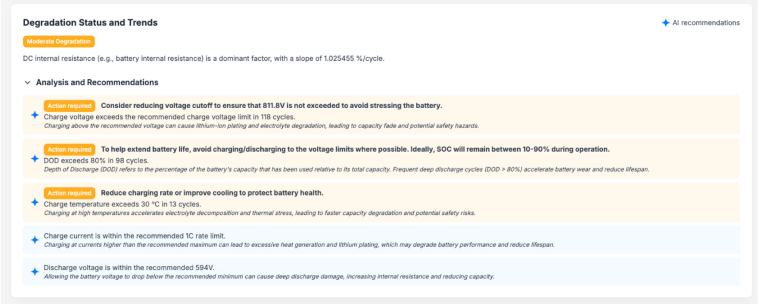
Electra Launches the First AI Agent with PhD-Level Intelligence for Battery Management

BOSTON, MA, UNITED STATES, March 19, 2025 /EINPresswire.com/ -- [Electra](#), the leader in AI-driven battery intelligence, is once again transforming battery management with the integration of [LLM](#) (Large Language Model) technology into its EVE-Ai platform. This cutting-edge advancement introduces an [AI agent](#) with PhD-level intelligence for battery management, making EVE-Ai's predictive insights and controls more accessible than ever—empowering all users, not just battery experts or technicians.

For the first time in the market, Electra's proprietary AI algorithms are integrated with industry-leading external LLM models, ensuring unparalleled accuracy, predictive power, and ease of use. This innovation transforms complex battery analytics into clear, actionable insights, bridging the gap between raw data and real-world decision-making for Energy Storage Operators (BESS), EV fleet managers, energy, robotics, and industrial businesses.

Bridging the Gap Between Data and User Action

Batteries generate vast amounts of performance, environmental, and usage data, yet managing them efficiently has remained a challenge due to the complexity of interpreting this information.



Degradation Status and Trends + AI recommendations

Mobile Degradation

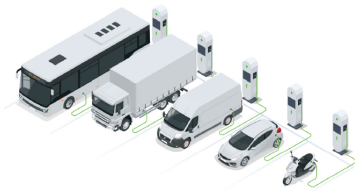
DC internal resistance (e.g., battery internal resistance) is a dominant factor, with a slope of 1.025455 %/cycle.

Analysis and Recommendations


- Action required:** Consider reducing voltage cutoff to ensure that 811.8V is not exceeded to avoid stressing the battery. Charge voltage exceeds the recommended charge voltage limit in 118 cycles. Charging above the recommended voltage can cause lithium-ion plating and electrolyte degradation, leading to capacity fade and potential safety hazards.
- Action required:** To help extend battery life, avoid charging/discharging to the voltage limits where possible. Ideally, SOC will remain between 10-90% during operation. DOD exceeds 80% in 98 cycles. Depth of Discharge (DOD) refers to the percentage of the battery's capacity that has been used relative to its total capacity. Frequent deep discharge cycles (DOD > 80%) accelerate battery wear and reduce lifespan.
- Action required:** Reduce charging rate or improve cooling to protect battery health. Charge temperature exceeds 30 °C in 13 cycles. Charging at high temperatures accelerates electrolyte decomposition and thermal stress, leading to faster capacity degradation and potential safety risks.
- Charge current is within the recommended 1C rate limit.
- Charge at currents higher than the recommended maximum can lead to excessive heat generation and lithium plating, which may degrade battery performance and reduce lifespan.
- Discharge voltage is within the recommended 59.4V.
- Allowing the battery voltage to drop below the recommended minimum can cause deep discharge damage, increasing internal resistance and reducing capacity.

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EVE-AI's LLM-based Recommendations




Up to 15% More Revenue per Mile
Optimized battery utilization increases fleet efficiency and profitability.



5 to 10% Higher Annual ROI
Enhanced battery performance directly boosts financial returns for energy storage operators.

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Electra's EVE-Ai ROI



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Electra's Business Cases

Electra's integration of this AI Agent into its EVE-Ai software solutions acts as an intelligent agent, translating raw technical data into plain English and enabling users to make data-driven decisions with clarity and confidence.

By analyzing 360° real-time data from battery performance, environmental conditions, and usage patterns, EVE-Ai, now enhanced by LLM capabilities, provides actionable intelligence that ensures batteries operate more efficiently, last longer, and avoid costly failures. This marks a paradigm shift: users no longer need to be battery experts to make expert-level decisions.

Unlike any other solution in the market, Electra's combines two AI-driven approaches:

- 1) Proprietary AI & ML algorithms are built to predict, prevent, and optimize battery performance.
- 2) Best-in-class aggregated LLMs models, integrating the latest advancements to maximize accuracy and usability.

This hybrid intelligence system ensures that BESS operators, fleet managers, and businesses can access today's most comprehensive battery risk assessment.

What Electra's AI Agent Does for Battery Management

- 1) Bridges Complex Data and User Understanding - No deep technical expertise is required. Electra's AI Agent translates complex battery metrics, risks, and optimization strategies into clear, actionable insights.
- 2) Provides Intelligent Insights & Passive Controls - Users receive real-time recommendations to optimize battery performance, prevent failures, and extend lifespan—whether for BESS, EV fleets, or industrial robotics.
- 3) Acts as an AI Battery Expert - Electra's AI agent functions as a real-time battery PHD-level specialist, making advanced analytics understandable, actionable, and accessible.

Predicting and Preventing Failures Before They Happen

Electra's EVE-Ai is already proven to predict battery failures up to three months in advance, identifying critical and non-critical faults, anomalies, and degradation trends long before they escalate. Now, with LLM, this capability is further enhanced by providing greater context, clarity, and interpretability, ensuring that operators not only receive alerts but also understand the underlying risks and the recommended course of action.

This advanced intelligence is crucial in preventing large-scale battery incidents such as thermal runaways and failures in high-profile energy storage deployments. Beyond safety, it also ensures:

- Longer Battery Life - Optimized battery usage reduces degradation and extends operational lifespan.
- Minimized Downtime - AI-driven fault prevention reduces costly failures and unplanned outages.
- Higher Financial Returns - Battery performance directly impacts financial outcomes. For battery energy storage systems (BESS), Electra's EVE-Ai contributes to an estimated 5-10% increase in

annual ROI. For EV fleets, optimized battery utilization translates into up to 15% more revenue per mile—a significant improvement in an industry where margins are directly tied to uptime and efficiency.

Democratizing Battery Management with the First AI Agent for Battery Intelligence

LLM is not just an enhancement; it is a fundamental shift in how battery data is processed and delivered. By acting as a real-time PhD-Level Intelligence for Battery Management, it ensures that users of all backgrounds - whether energy operators, fleet managers, or industrial businesses - can access and act upon the intelligence they need to optimize operations and mitigate risk.

This technology is fully scalable across all applications, from BESS to EV fleets, industrial robotics, and beyond. Furthermore, it is battery chemistry-agnostic, making it adaptable to any energy storage system, regardless of manufacturer or chemistry type.

Shaping the Future of Battery Intelligence

“With this AI Agent based on LLM, we are removing barriers to battery intelligence,” said Giovanni Rossi, Global Marketing and Communications Director at Electra. “For too long, battery management has required highly specialized expertise. Our AI-driven approach changes that by making advanced battery analytics not only predictive but also understandable and actionable. By combining our proprietary AI models with the best the market has to offer, we are delivering the most comprehensive and accessible battery intelligence platform available today.”

Electra’s AI agent represents the next frontier in AI-powered energy storage management, ensuring greater reliability, safety, and profitability across all battery-powered applications.

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